APPENDIX A
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For separate, above-ground, non-interconnected propane tanks, one way to determine whether the tanks constitute a single process (i.e., in rule language are "co-located") is to determine whether they are close enough together for a vapor cloud explosion resulting from the release of the total contents of one tank to cause the catastrophic failure of an adjacent tank. Table A-1 indicates estimated separation distances based on this method.

TABLE A-1
ESTIMATED SEPARATION DISTANCES FOR CONSIDERING NON-INTERCONNECTED PROPANE TANKS AS SEPARATE PROCESSES

Tank Capacity (gal)	Tank Confinement	Estimated Separation Distance (ft)
500	Partial - High	61
500	Low	41
1000	Partial - High	76
1000	Low	51
2000	Partial-High	96
2000	Low	64

The estimated separation distances in Table A-1 corresponding to "Partial - High" confinement are based on a TNT-equivalent yield factor of 10%. This is the same yield factor specified in the RMP rule for conducting flammable gas worst-case scenario modeling using TNT-equivalent methods (readers should note that the distances in Table A-1 are not intended as worst-case endpoint distances). This yield factor is appropriate for vapor cloud explosions occurring in areas with numerous obstructions, such as in pipe racks, between stacks of crates or pallets, or near other closely spaced structures[1]. Table A-1 distances corresponding to "Low" confinement may be used if your propane tanks are located outdoors[2] in relatively flat, open terrain with few structures nearby (these separation distances are based on a TNT-equivalent yield factor of 3%). Otherwise, the distances corresponding to "Partial-High" confinement should be used to give reasonably conservative separation distance estimates.

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[1] Vapor cloud explosions occurring in congested or confined spaces are generally stronger due to higher flame speeds resulting from turbulence produced in unburned gases expanding ahead of the propagating flame front.

[2] NFPA-58 generally requires propane tanks to be located outside of buildings.

To determine whether adjacent, non-interconnected propane tanks constitute a single process, measure the linear distance between the tanks and compare it to the estimated separation distance in Table A-1 for tanks of that size and with that degree of confinement. Tanks that are separated by less than the estimated separation distance in Table A-1 should generally be considered a single process and their quantities added together to determine if the process exceeds the RMP threshold of 10,000 pounds. Individual tanks of propane which are separated by at least the estimated separation distance in Table A-1 for tanks of that size and with that degree of confinement may generally be considered as separate processes and thus not subject to the RMP regulation.

The distances provided in the Table above should be treated as estimates. Other methods of determining separation distances may provide more accurate estimates and you are free to use other reasonable methods if you choose. Also, the separation distances provided here should be considered in relation to any unique circumstances at your site, such as topography, the presence of structures and obstacles, the presence of blast-mitigation features, and other site-specific factors. For example, if engineered blast-barriers are located between tanks, or if your tanks are underground, smaller separation distances may be appropriate[3]. On the other hand, topographical features, such as a depression between two tanks where heavier-than-air propane vapor might collect, may warrant the use of larger separation distances. Additionally, you should evaluate whether there are potential events other than vapor cloud explosions that could reasonably be expected to cause multiple tanks to fail, even at distances larger than those in Table A-1. EPA believes that for most properly designed outdoor propane installations, such events are extremely unlikely, and that separating tanks by at least the appropriate distance in Table A-1 is sufficient to establish separate processes. However, you should evaluate your own circumstances and maintain documentation to support your determination.

Some readers of this guidance may conclude that it will be easier to re-locate one or more of their propane tanks to conform to the distances provided above rather than taking the steps necessary to comply with the regulation. This is certainly permitted, and in some cases may be an appropriate risk-reduction measure. However, when taking such actions, you should be careful to maintain sufficient separation distances between your propane tanks and nearby buildings, roads, and public receptors. EPA recommends consulting NFPA-58 or other applicable codes or standards to identify such distances.

[3] NFPA-58 generally recommends against installing fire walls, fences, earth or concrete barriers, and other similar structures around or over non-refrigerated LP-gas containers. There are some exceptions. For example, the standard permits such structures to partially enclose LP-gas containers, if the structure is designed in accordance with a sound fire protection analysis.